

NOTE

Rapid and Non-Destructive Gender Determination of  
Nymphal and Adult *Cryptocercus punctulatus* Scudder  
(Dictyoptera: Cryptocercidae)

The primitive xylophagous cockroach, *Cryptocercus punctulatus* Scudder, is distributed throughout the eastern and northwestern United States. Closely allied to the termites, family units of *C. punctulatus* live within decaying logs (Nelepa, 1984, Behav. Ecol. Sociobiol. 14: 273-279). Because of its unique biology, *C. punctulatus* has become a popular laboratory and field research insect.

The gender of most cockroaches is easily determined by the presence (males) or absence (females) of styles on the sub-genital plate. In addition, the females of many blattid species have divided sub-genital plates. The Cryptocercidae, however, possess expanded seventh tergal and sternal sclerites that completely conceal abdominal segments 8-10, the cerci, and the male's styles (McKittrick, 1964, Cornell Univ. Agric. Exp. Sta. Memoir 389, 197 pp.). Living *C. punctulatus* tightly close their supra- and sub-genital plates concealing the cerci and styles. In addition, living males reportedly have a distinctive odor and females have a dorsal abdominal gland between tergites VI and VII (Seelinger and Seelinger, 1983, Z. Tierpsychol. 61: 315-333). Pinned specimens have either closed genital plates or slightly opened plates with shrunken or hidden styles. In such instances, gender determinations have been based upon dissection. Thus, confirmation of gender by the presence of styles is difficult and time consuming. Herein, I describe a morphological character of the subgenital plate that will allow the rapid and non-destructive determination of gender of *C. punctulatus*.

Examination of living and preserved ( $n = 43$ ) female *C. punctulatus* revealed apicolateral emarginations of the subgenital

plate and a subtruncate apical median prominence (Fig. 1A). These characters were readily visible on nymphs (second through last instar) and adults. There were no emarginations, but a narrowly rounded apical median prominence on this area was present in nymphal and adult male *C. punctulatus* ( $n = 54$ ) (Fig. 1B). It is possible that subgenital plate emarginations of Cryptocercidae were the precursor to the completely divided plates of the Blattidae. The gender of a few ( $n = 4$ ; 3.96%) preserved second and third instar *C. punctulatus* nymphs could not be identified by this character. However, these nymphs were light brown and not completely sclerotized. The entire

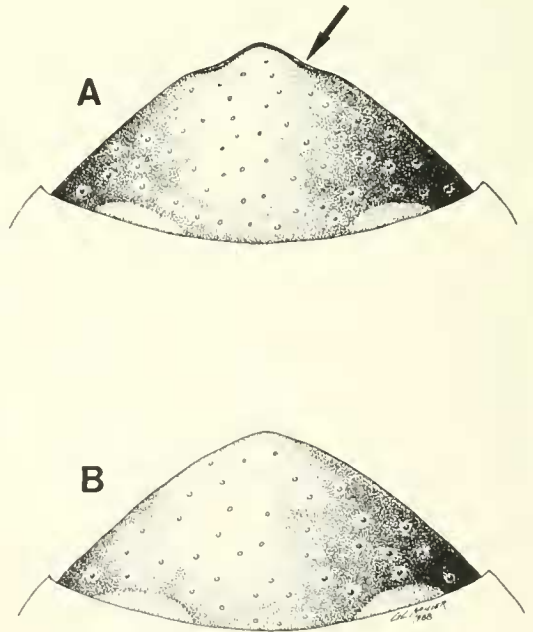


Fig. 1. Subgenital plates of adult female (A) and male (B) *Cryptocercus punctulatus*. Arrow indicates the apicolateral emargination.

subgenital plate had shriveled, making the apical area character ambiguous. With this exception, the presence (female) or absence (male) of an apicolateral emargination of the subgenital plate is a diagnostic character for gender determination in *C. punctulatus*.

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Sex and Deposition of the Holotype of  
*Bareogonals canadensis* (Harrington)  
(Hymenoptera: Trigonalyidae)

Prior to 1900 the yellowjacket parasitoid *Bareogonals canadensis* (Harrington) was known only from the holotype collected in 1893 at Victoria, British Columbia (Harrington, 1896. *Canad. Entomol.* 28: 108), and 27 specimens collected on Gabriola Island in 1897 by Taylor (1898. *Canad. Entomol.* 30: 14-15). The present deposition of 19 of these 28 specimens is known (Table 1). The holotype was reported lost by Townes (1956. *Proc. U.S. Nat. Mus.* 106: 295-304) but Sarazin (1986. *Canad. Entomol.* 118: 957-989) claimed that the holotype is in the Canadian National Collection (CNC). From a study of the pre-1900 material, I conclude that the true holotype is in the Zoologisches Museum der Humboldt-Universitaet (Berlin).

Harrington (1896) described the holotype as a male. Taylor (1898) reversed the sexes of his series and Harrington accepted this mistake. Harrington erroneously stated that the holotype was a female, and described the "male" sex using three females (autotypes) (Harrington, 1898. *Canad. Entomol.* 30: 15-16). Harrington's error, though noted by Schulz (1907a. *In* Wytzman, *Genera Insectorum* 61: 24 pp.), has been perpetuated by others, including Carlson (1979.

1197-1198. *In* Krombein et al. *Catalog of Hymenoptera in America north of Mexico*. Vol. I. Smithsonian: Wash., D.C. 1198 pp.) and Sarazin (1986).

The deposition of all four males from Taylor's series is known (Table 1) but at the Zoologisches Museum der Humboldt-Universitaet (Berlin) a fifth male has labels from Taylor's series with a date (24 Oct 1897) on which only females were collected. Schulz [1907b, (1906). *Berl. Entomol. Zeit.* 51: 303-333] said he received the "typischen Pärchen" (typical pair). This fifth male fits the holotype description; apparently its original labels have been switched with the labels on one of the three autotypes to correspond with Harrington's 1898 statement that the holotype is a female. The holotype currently has labels that read: "Gabriola Isd. B.C., Taylor, 24-10-97 [Taylor's handwriting]/*Trigonalyis canadensis* Harrington, Type ♂ [Harrington's handwriting]/ *Zool. Mus., Berlin.* [printed label]." The holotype labels, now on the autotype, read: "Victoria V.I. [no date, Harrington's handwriting]/ *Trigonalyis canadensis* Harrington, Type ♀ [Harrington's handwriting]/ *Zool. Mus., Berlin.* [printed label]."

Two autotypes at the Canadian National Collection (CNC, Ottawa), with locality and